

A. HATCH.
Measuring Tapers.

No. 62,267.

Patented Feb. 19, 1867.

Fig. 1

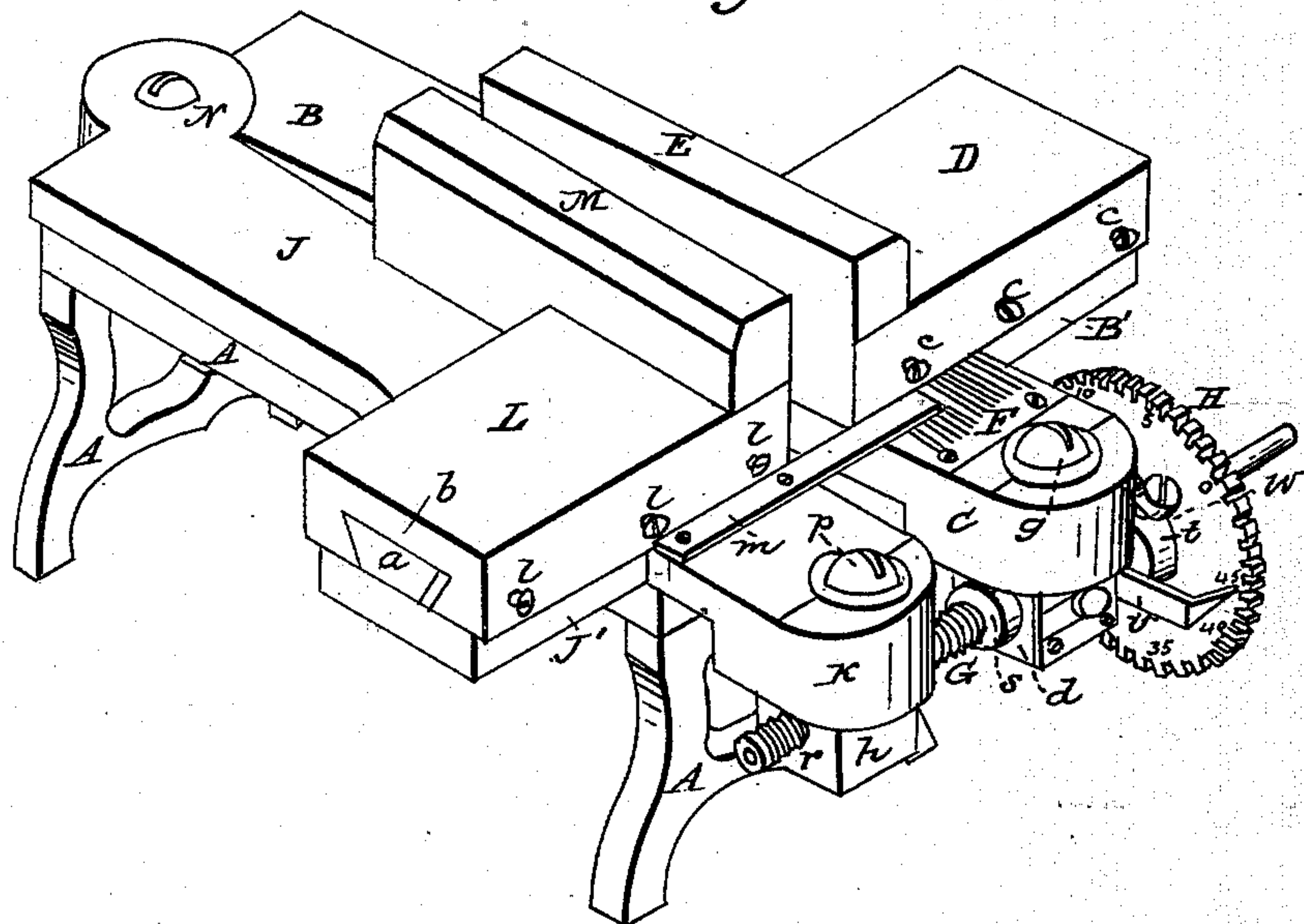
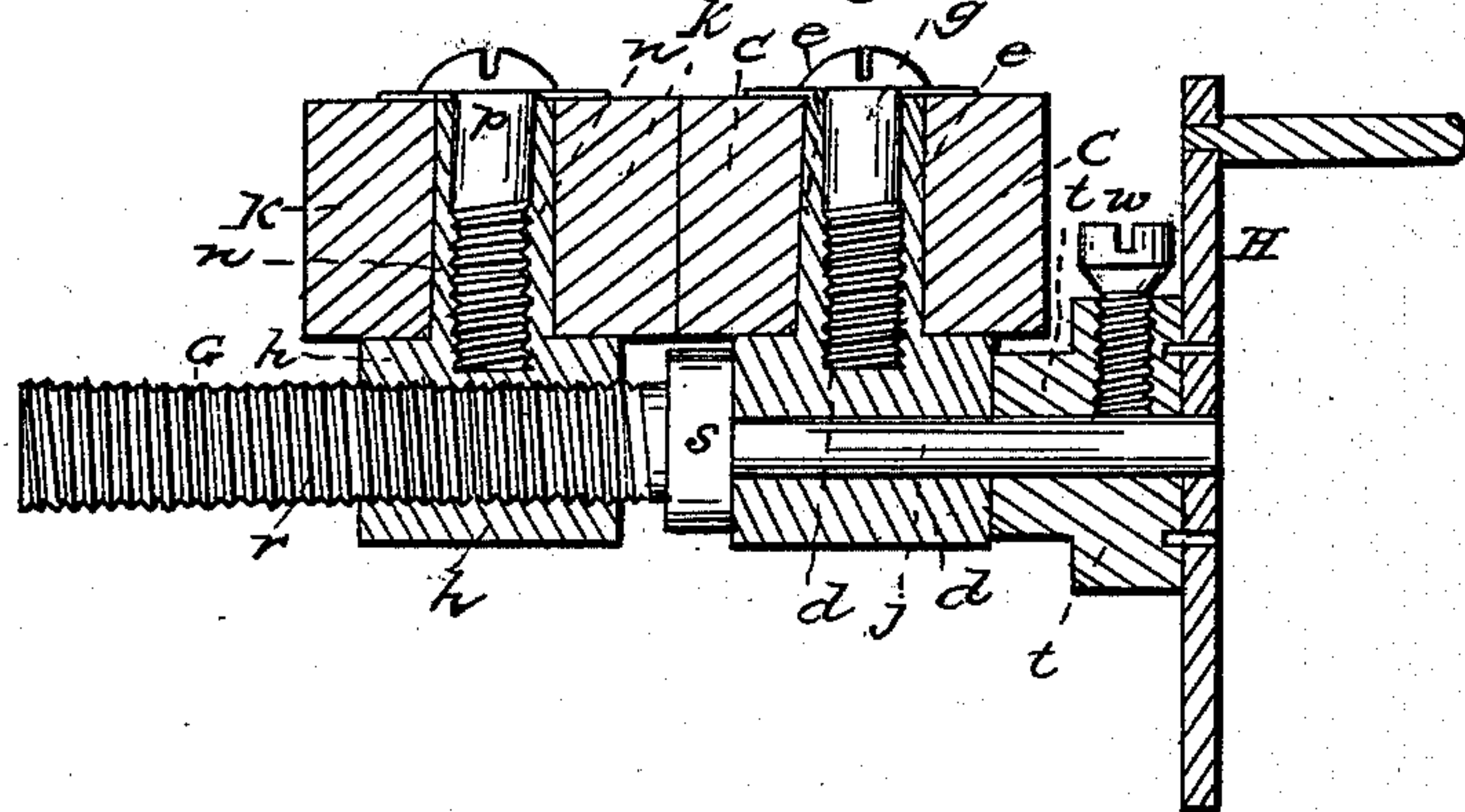


Fig. 2



Witnesses:
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ANSON HATCH, OF NEW HAVEN, CONNECTICUT.

Letters Patent No. 62,267, dated February 19, 1867.

IMPROVEMENT IN APPARATUS FOR TAPERING MEASURES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, ANSON HATCH, of the city and county of New Haven, in the State of Connecticut, have invented a new and useful improvement in Apparatus for Measuring or Determining the Rate or Degree of the Taper on any solid whose sides are right lines; and I do hereby declare that the following is a full, clear, and exact description of the construction, character, and operation of the same, reference being had to the accompanying drawings, which make part of this specification, in which—

Figure 1 is a perspective view of the machine or apparatus, showing the index-wheel, screw, graduated plate, bars, jaws, &c.

Figure 2 is a section of the same, cut vertically through the centre of the index-wheel and screw, and across the bars or arms, &c.

My improvement consists in attaching two bars or arms at one end of each by a proper joint-pin or screw, on which joint-pin one of the arms vibrates or swings, so that the two arms may be brought together perfectly parallel with each other; or they may, by the use of an index-wheel and a screw, be separated at the front or detached ends, so that the two arms will form the two equal sides of an isosceles triangle, while the base or unequal side may be set or adjusted to any desired extent by turning the index-wheel and screw; and in attaching to these arms, by suitable dove-tail slides, two jaws similar to the jaws of a vise, with their faces parallel to each other, or inclined in the same manner and in the same degree as the arms are at all times, although they may be much further apart, so that a tapering piece may be measured so as to determine the number of one-thousandth parts of an inch it tapers in one inch in length without reference to its diameter or length. I make the frame of the machine or apparatus of cast iron or any other suitable material, substantially of the form indicated at A A A, fig. 1, or in any other convenient form. I make the stationary arm substantially as indicated at B B' and C, fig. 1, and in section at C C, fig. 2, and secure it to the frame A by means of screws or otherwise, so as to hold all of the work firm and steady. On the broad part of this stationary arm, as near B', I attach or cast a dove-tail piece like that indicated at *a*, fig. 1, on to which I slip the piece D, which has in its under side a dove-tail space like that shown at *b*, fig. 1, on which slide or piece D I fit or cast the stationary jaw, as E, and I secure this piece D on the dove-tail by means of binding screws, as *c c c*. In front of the piece D, I fit a graduated scale, as F, fig. 1, graduated to correspond with the threads of the screw G, figs. 1 and 2, so that by counting the lines I can at once determine how many times the index-wheel H has been turned, which will determine the degree of inclination of the two arms, and consequently of the two jaws. In the front end of this stationary arm I fit a block, as *d d*, which works in the end C C with a round tenon, as *e e*, which I secure in its place by a screw, *g*, in such a manner that it will turn freely to preserve its parallelism with the other block, *h h*, whatever may be the inclination of the two arms; and through the centre of this block *d d* I make a hole in which the shaft *j* of the graduated screw *g* works, all as represented in fig. 2, and indicated in fig. 1. I make the movable arm J J' and K of the same shape as the stationary one B B' and C, but reversed, and I secure it to the frame and stationary arm by a proper joint, as shown at N, fig. 1; and I fit the piece L, jaw M, with the dove-tail *a* and *b*, and secure it with binding screws *l l l* precisely as described above for the stationary arm; and I attach to this movable arm a metallic pointer, as *m*, to indicate on the graduated scale F the number of turns of the screw G, or index-wheel H; and I make each of these arms ten inches in length, as a convenience for computation, &c. And in the front end of the movable arm J J' and K, I fit a block, *h h*, with a round tenon, *n n*, secured by a screw, *p*, all as represented in fig. 2, and indicated in fig. 1, and operated in the same manner as those described in connection with the stationary arm. And through the block *h h* I drill and tap a hole for the graduated screw G, as shown in section at *r*, fig. 2, and indicated in fig. 1. I make all the parts heretofore described of cast iron or any other suitable material, except the screws, which should be made of steel. I make the graduated screw G of cast steel or any other suitable material, of twenty threads to the inch, when the index-wheel has fifty notches or spaces, or with ten threads to the inch when the index-wheel has one hundred notches or spaces; so that by revolving the wheel, one notch will set the arms and jaws inclined to the degree of one-thousandth part of an inch in the length of one inch. On this screw G, I turn or leave a collar, as shown at *s*, figs. 1 and 2; and I turn the shank or shaft back of collar down to a convenient size to work in the hole

through the block *d d*, as shown at *j*, and I make it long enough to extend through the index-wheel H and its collar *t t*, all as shown in section in fig. 2, and indicated at *t*, fig. 1. I make the index-wheel H, figs. 1 and 2, with fifty notches or spaces when I use a screw with twenty threads to the inch, or with one hundred notches when I use a screw of ten threads to the inch, as stated above; and I secure this index-wheel in any suitable manner to a collar like *t*, figs. 1 and 2, which, when properly adjusted, I secure by a binding screw, as *w*, figs. 1 and 2, or by any other convenient means, so that the shoulder of the collar *t* will run against the block *d d*, as shown in fig. 2, so as not to allow of any end chase to the screw G to affect the graduation of the inclination of the arms. I make a suitable index or point to enter the notches or spaces in the index-wheel, and fit it to a suitable slide to allow a reciprocating motion, as shown at *v*, fig. 1. Having made and arranged the several parts as before described and represented in fig. 1, by revolving the index-wheel H, I bring the two arms to the inclination to cause the faces of the two jaws E and M to exactly fit the taper of the article which I am measuring, having moved the jaw M in or out, to suit the diameter of the article. I then read on the graduated scale F the number of full turns of the index-wheel, and the balance or number of notches on the index-wheel, and divide the amount by ten, (that being the length of the arms,) which will give the taper in the thousandths of an inch to one inch in length. I may also fit this index-wheel, screw, &c., on the piece D, fig. 1, and have the adjusting or graduating screw G pass through the jaw E, and work in a female thread in the jaw M, so that when the arms, and consequently the jaws, are parallel, I may by the use of the index-wheel, &c., measure the diameter or side of any piece whose sides are parallel with equal certainty to the one-thousandth part of an inch. But the apparatus could not be fitted to measure tapers and prisms at the same time, as one would interfere with the other, and that for measuring parallels must be removed when the other is used.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the two arms and jaws with the index-wheel and screw, when they are constructed, arranged, and fitted for measuring tapers, substantially as herein described.
2. I claim the combination of the two jaws with the index-wheel and screw, when they are constructed, arranged, and fitted for measuring the diameters or sides of prisms, or articles whose opposite sides are parallel, substantially as herein described and set forth.

ANSON HATCH.

Witnesses:

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